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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/858,365	05/16/2001	Heiko Hunold	81127LPK	3213

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Lawrence P. Kessler
Patent Department
NexPress Solutions LLC
1447 St. Paul Street
Rochester, NY 14653-7103

EXAMINER	
HUNTSINGER, PETER K	

ART UNIT	PAPER NUMBER
2624	

DATE MAILED: 07/13/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/858,365	HUNOLD ET AL.	
	Examiner	Art Unit	
	Peter K. Huntsinger	2624	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *20 April 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,4,5,7,8 and 10-15* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,4,5,7,8 and 10-15* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1. The amendment filled on 20 April 2005 has been entered in full.

2. Based on the applicant's amendment, the objection to the specification has been withdrawn.

Claim Objections

3. Claim 8 is objected to because of the following informalities: The first line of claim 8 should state, "An apparatus". Appropriate correction is required.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 1, 4, 5, 8, and 10-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nozaki et al. U.S. Patent 6,236,415 and Takahashi et al. U.S. Patent 5,444, 525.

Referring to claim 8, Nozaki et al. disclose an apparatus for digital control of register in a multicolor printing machine by controlling the production of lines of image points of an element of a printing machine with a control system wherein the control

system comprises: a selecting device (image-write-timing control circuit of Fig. 2, col. 15, lines 13-21) for a successive assignment of two non-coincident digital variables, said selecting device performs an integer assignment of the small steps of the first variable (Fig. 20, main-scanning recording lines, col. 3, lines 56-64) to a large step of the second variable (plane image, col. 9, lines 19-21) (Fig. 18A and 18B, ITOP signal, col. 2, lines 9-15) such that the numerical ratio remains constant or is changed such that the assignment error never reaches the width of the smaller steps of the first variable in any assignment (Fig. 15, col. 27, lines 37-45). The ITOP or sub-scanning start signal corresponds to a predetermined number of BD signals (col.15, lines 41-46). Each BD signal corresponds to a single main scanning line (Fig. 18A and 18B, col. 2, lines 16-19). While figures 18A, 18B, and 20 are disclosed in the description of prior art section of Nozaki et al., the drawing applies to Nozaki et al.'s invention as shown in figure 2. Nozaki et al. do not disclose expressly determining a non-integer remainder to be added to the larger variable during assignment. Further, Takahashi et al. discloses determining the residual at each time the cylinder revolves (col. 8, lines 35-53), while Nozaki et al. discloses the assignment of the smaller steps to larger variable is made each time the cylinder revolves (col. 2, lines 9-15) (col. 15, lines 13-21). Takahashi et al. disclose a memory in which, a remaining non-integer residual is set and added during each revolution (col. 8, lines 35-53). Nozaki et al. and Takahashi et al. are combinable because they are from the same field of printing registration systems. At the time of the invention, it would have been obvious determine and add a residual during each assignment of smaller steps to a larger variable. The motivation for doing

so would have been to eliminate registration errors when the rotational speed fluctuates. Therefore it would have been obvious to combine Takahashi et al. with Nozaki et al. to obtain the invention as specified in claim 8.

Referring to claim 1, Nozaki et al. disclose a method for the digital control of register in a multicolor printing machine by controlling the production of lines of image points of an element of the printing machine, according to claim 8, with an assignment, based on measuring the positions of elements that carry images and substrates of two non-coincident digital variables comprising the steps of: for successive assignments, an integer assignment of small steps of a first variable (Fig. 20, main-scanning recording lines, col. 3, lines 56-64) to a large step of a second variable (plane image, col. 9, lines 19-21) (Fig. 18A and 18B, ITOP signal, col. 2, lines 9-15) is carried out such that for each assignment the numerical ratio remains constant or is changed in such that the assignment error never reaches the width of the smaller steps of the first variable in any assignment, nor exceeds half the width of the digital steps of the smaller variable in any assignment (col. 27, lines 1-10). The ITOP or sub-scanning start signal corresponds to a predetermined number of BD signals (col.15, lines 41-46). Each BD signal corresponds to a single main scanning line (Fig. 18A and 18B, col. 2, lines 16-19). While figures 18A, 18B, and 20 are disclosed in the description of prior art section of Nozaki et al., the drawing applies to Nozaki et al.'s invention as shown in figure 2. Nozaki et al. do not disclose expressly determining a non-integer remainder to be added to the larger variable during assignment. Further, Takahashi et al. discloses determining the residual at each time the cylinder revolves (col. 8, lines 35-53), while

Nozaki et al. discloses the assignment of the smaller steps to larger variable is made each time the cylinder revolves (col. 2, lines 9-15) (col. 15, lines 13-21). Takahashi et al. disclose a memory in which, a remaining non-integer residual is set and added during each revolution (col. 8, lines 35-53). Nozaki et al. and Takahashi et al. are combinable because they are from the same field of printing registration systems. At the time of the invention, it would have been obvious determine and add a residual during each assignment of smaller steps to a larger variable. The motivation for doing so would have been to eliminate registration errors when the rotational speed fluctuates. Therefore it would have been obvious to combine Takahashi et al. with Nozaki et al. to obtain the invention as specified in claim 1.

Referring to claim 4, Nozaki et al. disclose assigning lines of image points (main scanning lines of Fig. 18A and 18B, col. 2, lines 1-5) produced on the image cylinder to fixed angular sequences of the image cylinder (length of recording sheet, col. 15, lines 13-21). Nozaki et al. does not explicitly disclose using multiple image cylinders to print an image. At the time of the invention, it would have been obvious to implement multiple image cylinders to print an image. The motivation for doing so would have been to designate an image cylinder to each color to increase the speed in printing images, which is a standard process in color printers (Official Notice, see MPEP 2144.03). While figures 18A and 18B are disclosed in the description of prior art section of Nozaki et al., the drawing applies to Nozaki et al.'s invention as shown in figure 2.

Referring to claim 5, Nozaki et al. disclose in order to achieve coincidence of register between the color separations (plane images) produced by the color printing

units (developer units 219-222 of Fig. 1, col. 12, lines 39-43), said color separations are subdivided into areas which are assigned to one another (col. 12, lines 61-65), the areas consisting of a fixed number of lines of image points. Nozaki et al. disclose an ITOP signal corresponding to the generating of each color (col. 12, lines 47-52). The ITOP signal corresponds to a predetermined number of BD signals (col.15, lines 41-46). Each BD signal corresponds to a single main scanning line (Fig. 18A and 18B, col. 2, lines 16-19). While figures 18A and 18B are disclosed in the description of prior art section of Nozaki et al., the drawing applies to Nozaki et al.'s invention as shown in figure 2.

Referring to claim 10, Nozaki et al. discloses the control system (CPU 130 of Fig. 2, col. 14, lines 19-22) is designed in such a way that, for an assignment of the steps, it forms the sum of the magnitude to be assigned (col. 27, lines 1-10). Takahashi et al. discloses the assignment error of the previous assignment (col. 8, lines 35-53). Nozaki et al. or Takahashi do not disclose expressly rounding up if the magnitude exceeds half a smaller step and rounding down if the magnitude falls below half a smaller step. Official Notice is taken that it is well known and obvious in the art to round up if the magnitude exceeds half a variable, or round down if the number is less than half (Official Notice, see MPEP 2144.03). Further, it is common in computer systems to round a number before converting to binary, which has determined limits for the length of a variable. The motivation for doing so would be to reduce the memory needed for storing larger numbers.

Referring to claim 11, Nozaki et al. disclose the control system (CPU 130 of Fig. 2, col. 14, lines 19-22) is used to control the register of a multicolor printing machine, by controlling image production equipment (semiconductor laser 102 of Fig. 2, col. 14, lines 28-37) assigned to an image cylinder (photosensitive drum 105 of Fig. 2, col. 14, lines 34-37) for the production of lines of image points (main scanning lines of Fig. 18A and 18B, col. 2, lines 1-5) on the image cylinder (col. 15, lines 13-21). Nozaki et al. does not explicitly disclose using multiple image cylinders to print an image. At the time of the invention, it would have been obvious to implement multiple image cylinders to print an image. The motivation for doing so would have been to designate an image cylinder to each color to increase the speed in printing images, which is a standard process in color printers (Official Notice, see MPEP 2144.03).

Referring to claim 12, Nozaki et al. disclose the control system (CPU 130 of Fig. 2, col. 14, lines 19-22) is set up to assign the lines of image points (main scanning lines of Fig. 18A and 18B, col. 2, lines 1-5) to fixed angular sequences (length of recording sheet, col. 15, lines 13-21) of the image cylinders (photosensitive drum 105 of Fig. 2, col. 14, lines 34-37). Nozaki et al. does not explicitly disclose using multiple image cylinders to print an image. At the time of the invention, it would have been obvious to implement multiple image cylinders to print an image. The motivation for doing so would have been to designate an image cylinder to each color to increase the speed in printing images, which is a standard process in color printers (Official Notice, see MPEP 2144.03).

Referring to claim 13, Nozaki et al. disclose the control system (CPU 130 of Fig. 2, col. 14, lines 19-22) is set up in order to achieve coincidence of register between the color separations (plane images) produced by color printing units (developer units 219-222 of Fig. 1, col. 12, lines 39-43), to subdivide said color separations into areas and assign these areas to one another (col. 12, lines 61-65), the areas having a fixed number of lines of image points. Nozaki et al. disclose an ITOP signal corresponding to the generating of each color (col. 12, lines 47-52). The ITOP signal corresponds to a predetermined number of BD signals (col.15, lines 41-46). Each BD signal corresponds to a single main scanning line (Fig. 18A and 18B, col. 2, lines 16-19). While figures 18A and 18B are disclosed in the description of prior art section of Nozaki et al., the drawing applies to Nozaki et al.'s invention as shown in figure 2.

Referring to claim 14, Nozaki et al. disclose sensor (ITOP sensor 801 of Fig. 2, col. 2, lines 9-15) are provided for measuring the position of elements that carry images and substrates, and the control system (CPU 130 of Fig. 2, col. 14, lines 19-22) is set to perform the assignment on the basis of position measurement determined by the sensor (col. 27, lines 37-45). Nozaki et al. does not explicitly disclose using multiple image cylinders and corresponding sensors. At the time of the invention, it would have been obvious to implement multiple image cylinders and corresponding sensors. The motivation for doing so would have been to designate an image cylinder to each color to increase the speed in printing images, which is a standard process in color printers. Further, a sensor for each cylinder would be required to determine positioning.

6. Claim 7 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nozaki et al. U.S. Patent 6,236,415 and Takahashi et al. U.S. Patent 5,444, 525 as applied to claim 4 and 14 above, and further in view of Hoshino et al. U.S. Patent 4,912,491.

Referring to claim 7, Nozaki et al. disclose the method of claim 4, but do not expressly disclose the printing of register marks. Hoshino et al. disclose assignment of the acquisition and evaluation of the data from register marks (16a, 16b, 16c, 17a, 17b, 17c, Fig. 1, col.4, lines 5-10) printed by the color printing units (col. 4, lines 18-22). Nozaki et al. and Hoshino et al. are combinable because they are from the same field of printing superimposed images. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to implement printing and evaluating register marks as disclosed by Hoshino et al. into the printing system of Nozaki et al. The motivation for doing so would have been to improve the positioning accuracy during printing and due to the conventionality of the use of register marks in multicolor printing. Therefore it would have been obvious to combine Hoshino et al. with Nozaki et al. to obtain the invention as specified in claim 7.

Referring to claim 15, Nozaki et al. disclose the control system (CPU 130 of Fig. 2, col. 14, lines 19-22) is set up to initiate the printing of register marks (19, 19', 19", 19'"), wherein a sensor (22) is provided to detect the register marks (16a, 16b, 16c, 17a, 17b, 17c, Fig. 1, col.4, lines 5-10), and wherein the control system is set up to evaluate the data from the register marks such that the assignment of the areas of the color separations (plane images) to one another is carried out to achieve coincidence of

register (col. 12, lines 61-65), and the assignment of the lines of image points (main scanning lines of Fig. 18A and 18B, col. 2, lines 1-5) to angular sequences (length of recording sheet, col. 15, lines 13-21) is carried out to reduce the error (Fig. 15, col. 27, lines 37-45).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Peter K. Huntsinger whose telephone number is (571)272-7435. The examiner can normally be reached on Monday - Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Moore can be reached on (571)272-7437. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

David Moore

PKH

DAVID MOORE
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600